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FLOOD INSURANCE STUDY

VILLAGE OF PALMYRA, NEW YORK
WAYNE COUNTY

JULY 15, 1988

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Federal Emergency Management Agency

COMMUNITY NUMBER - 360896

COMPLETED

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
VILLAGE OF PALMYRA, WAYNE COUNTY, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates a previous Flood Insurance Study/Flood Insurance Rate Map for the Village of Palmyra, Wayne County, New York. This information will be used by the community to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses in this study represent a revision of the original analyses. The hydrologic and hydraulic analyses for Red Creek West in this revision were prepared by Goodkind & O'Dea, Inc., Consulting Engineers for the Federal Emergency Management Agency (FEMA), under Contract No. 3831. The work for this revision was completed in November 1976.

1.3 Coordination

On May 15, 1987, the Village of Palmyra was notified by FEMA of the initiation of a Flood Insurance Study for the community.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Palmyra, Wayne County, New York. The area of study is shown on the Vicinity Map (Figure 1).

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Red Creek West was studied by detailed methods for its flooding affecting the community. Red Creek West was revised to incorporate updated hydrologic and hydraulic analyses. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

An unnamed tributary to Red Creek West was studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the Village of Palmyra.

2.2 Community Description

The Village of Palmyra is located in the north-central portion of New York State and in the southern portion of Wayne County. Wayne County is directly east of Monroe County, which is a part of the Rochester metropolitan area. The center of the Village of Palmyra is approximately 22 miles southeast of the City of Rochester. The village is bordered by the Town of Palmyra to the north, east, and south; and the Town of Macedon to the west.

The Village of Palmyra is located in the Central Lowland Till Plain, a level of undulating country with elevations ranging from 425 to 700 feet. The outstanding features of the landscape are the drumlins running north-to-south, and the east-west glacial stream channel of Ganargua Creek that follows a winding course north of the village. Drainage patterns follow the valley troughs into the glacial channel containing Ganargua Creek and the Barge Canal. Wetlands are found in and adjacent to the well-defined channel varying 0.25 to 0.50 mile in width (Reference 1).

The soils, ranging from good to moderate in drainage capabilities, are mainly derived from glacial till and glacial outwash, and possess good agricultural potential. However, the drumlin topography of the area prohibits the use of much of the land for crops (Reference 2).

The floodplain of Red Creek West is rather broad with sparse development. Wetlands comprise much of the floodplain area.

2.3 Principal Flood Problems

The wide floodplain of Red Creek West consists of wetlands. Poor drainage contributes to the primary flooding problem in the watershed, both in the muck areas and along the floodplains.

Annual flooding due to a combination of spring runoff and snow melt occurs throughout the floodplains of Red Creek West. Agricultural damages account for most of the losses for this type of flooding. More serious flooding problems occasionally occur from ice jams at structures.

The June 1972 Tropical Storm Agnes produced the largest flood recorded in the area. Garlock, Inc., Mechanical Rubber Division, located just north of the Village of Palmyra on Red Creek West was one of the areas suffering substantial damages during the storm. Water retained by the concrete dam at the Garlock plant flooded a wide area. The June 1972 flood on the Ganargua Creek was estimated by the U. S. Geological Survey (USGS) in their Professional Paper 924 to have had a recurrence frequency of approximately 1 in 5 years and 1 in 15 years at the crest gages in Macedon (No. 0423450) and East Victor (No. 4234200), respectively (Reference 3). These frequencies are not accurate representations of Ganargua Creek downstream of the Barge Canal because of the substantial increase in drainage area and the attenuating effect of the Barge Canal.

2.4 Flood Protection Measures

There are no significant flood protection works along any of the streams studied. The embankment of the CONRAIL railroad that parallels Red Creek West serves as a levee in some areas, helping to restrict flooding during times of high water. The minor impoundment along Red Creek West, Garlock Dam Spillway, is used to retain water for use at the Garlock Rubber Plant.

3.0 ENGINEERING METHODS

For the flooding source studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for the flooding source studied in detail affecting the community.

Hydrologic analysis for Red Creek West was taken from the Flood Insurance Study for the Town of Palmyra (Reference 4).

To define discharge-frequency data for Red Creek West and Red Creek East, the regional relationship relating basin characteristics to stream flow characteristics was used (Reference 5). The peak discharges for the required recurrence intervals were obtained by straight line extrapolation of the log discharge-probability plot as was done for Ganargua Creek. Upon entering the Town of Palmyra, the slopes of both of these streams level out and the floodplains become fairly wide. These physical characteristics increase the overbank storage and cause the velocity of the flows to slow, thereby decreasing the downstream peak flows.

A summary of the drainage area-peak discharge relationships for the Red Creek West is shown in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
RED CREEK WEST					
At mouth	51.2	1,150	1,510	1,660	2,030
At corporate limits	43.5	1,550	2,030	2,250	2,700

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the source studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

The hydraulic analysis for Red Creek West was taken from the Flood Insurance Study for the Town of Palmyra (Reference 4).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and Flood Insurance Rate Map (Exhibit 2) where applicable.

Water-surface elevations of floods of the selected recurrence intervals were computed using the COE HEC-2 step-backwater computer program (Reference 6). Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals. Starting water-surface elevations for Red Creek West were obtained from the Flood Insurance Study for the Town of Arcadia for Ganargua Creek at the downstream border between the Towns of Arcadia and Palmyra (Reference 7). For Ganargua Creek, the computer model was adjusted until the profile for the June 1972 flood passed through the high-water marks obtained for that flood.

Roughness coefficients (Manning's "n") used in the hydraulic computations were estimated by field inspection at each cross section. Channel "n" values for Ped Creek West ranged from 0.035 to 0.040, and the overbank "n" values ranged from 0.040 to 0.080.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet (Reference 8).

For the stream studied by approximate methods, the 100-year flood boundary was delineated using topographic (Reference 9).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the Flood Insurance Rate Map (Exhibit 2).

4.2 Floodways

The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

No floodway was computed for Red Creek West in this study because the floodway lies completely outside the corporate limits.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain,and to areas of 100-year flooding where average depths are less than 1 foot, areas of 10-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

Flood Insurance Studies for the Towns of Palmyra and Macedon have been published (References 4 and 10). The results of this study are in agreement with the results of the Town of Palmyra study. This study does not agree with the Macedon study at the New York State Barge.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, 26 Federal Plaza, Room 1351, New York, New York 10278.

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LP3GG	Log-Pearson Type III - Analysis for gaged streams
HYDR/SEC/AN	Hydraulic Section Analysis
HYPLO	Hydraulic Cross Section Plot
STRCH	Selection of Study Reaches

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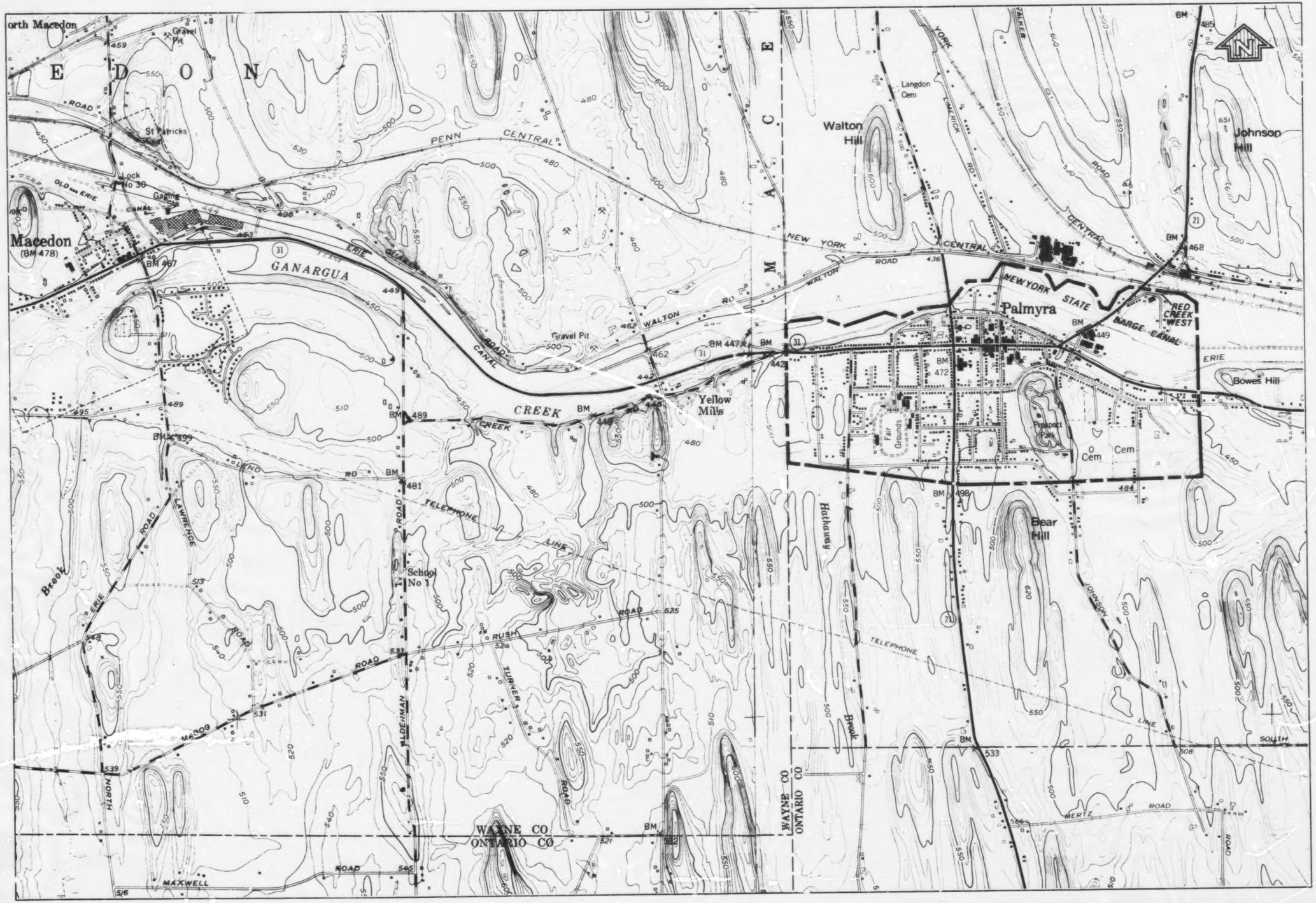

APPROXIMATE SCALE
6000 FEET
4000
2000
0
2000

VICINITY MAP

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF PALMYRA, NY
(WAYNE CO.)

FIGURE 1

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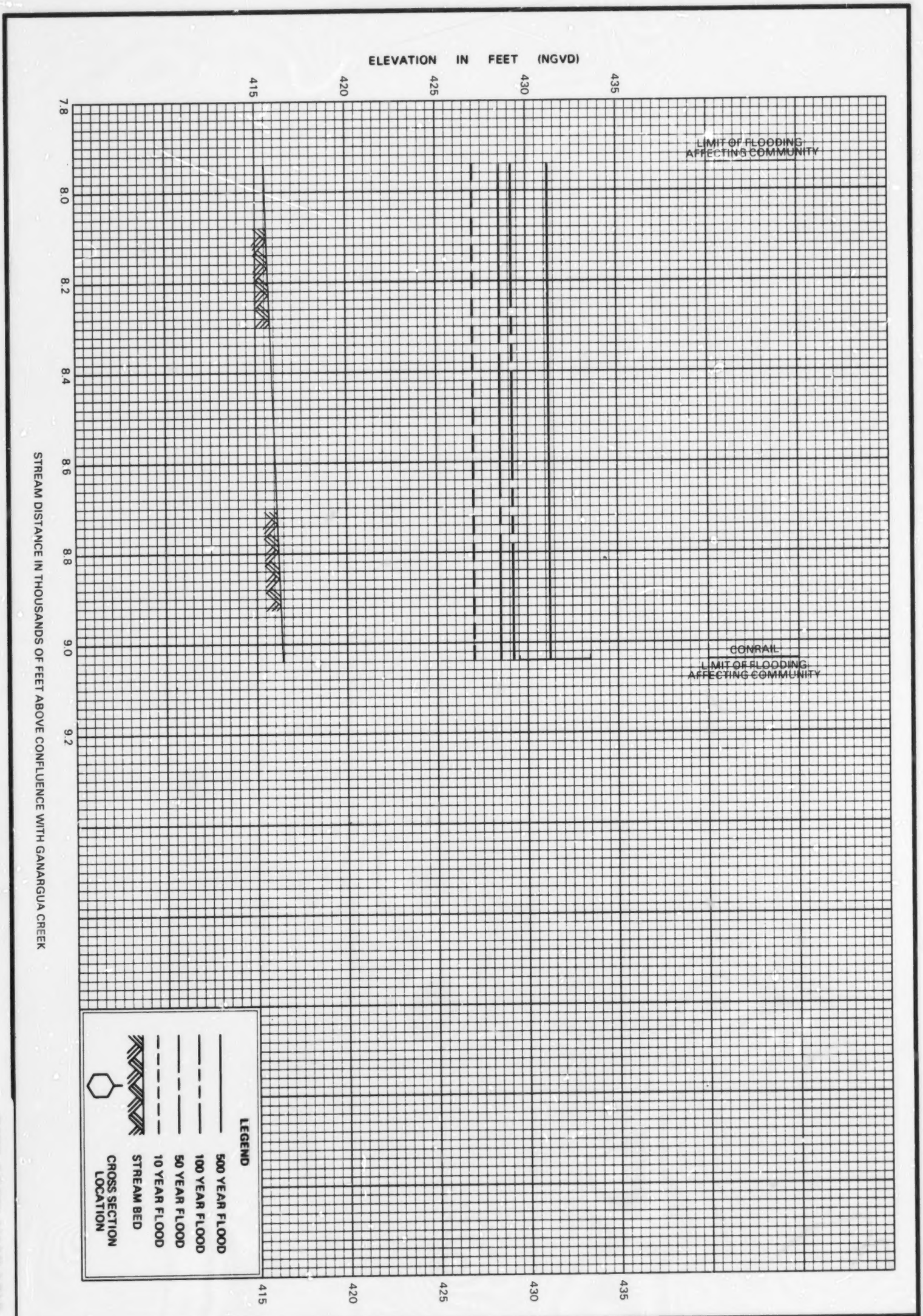

FEDERAL EMERGENCY MANAGEMENT AGENCY

VILLAGE OF PALMYRA, NY
(WAYNE CO.)

01P

FLOOD PROFILES

RED CREEK WEST

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